

WHAT IS CLAIMED IS:

1. A method for analyzing impurities present in a silicon substrate comprising the steps of:

    accommodating a silicon substrate resting on a support, and a solution for decomposing a silicon substrate which comprises a mixture of hydrofluoric acid, nitric acid and sulfuric acid, in a tightly sealed reaction vessel, in such a way as to keep the silicon substrate from directly contacting with the decomposition solution;

    allowing the decomposing solution to vaporize, thereby causing the substrate to decompose through vapor-phase reaction for sublimation, without requiring the reaction vessel to be heated or pressurized; and

    recovering the residue left by the decomposed substrate, to analyze the impurities contained in the substrate.

2. A method according to claim 1 wherein the mixing ratio of hydrofluoric acid, nitric acid and sulfuric acid occurs at (0.38 - 1.5) : (0.35 - 1.02) : (0.98 - 2.94) by weight.

3. A method according to claim 1 ~~or 2~~ further comprising the steps of:

    adding an acid mixture of hydrochloric acid and nitric acid to the recovered decomposition residue;

    heating the yield to 60 - 90°C, to allow the residue to sublimate; and

    quantitatively analyzing the remnants by atomic absorption spectroscopy or by inductively coupled plasma

mass spectroscopy.

4. A method according to claim 1 or ~~2~~ further comprising the steps of:

adding an acid mixture of hydrofluoric acid and nitric acid to the recovered decomposition residue;

heating the yield to 150 - 220°C, to allow the residue to sublimate; and

quantitatively analyzing the remnants by atomic absorption spectroscopy or by inductively coupled plasma mass spectroscopy.

5. A method according to claim 1 or ~~2~~ wherein the silicon substrate is a silicon wafer, the silicon wafer being inserted between two plates made of a fluorine resin having the same diameter which is a little smaller than that of the wafer, and the assembly being placed on the support.

6. A method according to claim 5 further comprising the steps of:

adding an acid mixture of hydrochloric acid and nitric acid to the recovered decomposition residue;

heating the yield to 60 - 90°C, to allow the residue to sublimate; and

quantitatively analyzing the remnants by atomic absorption spectroscopy or by inductively coupled plasma mass spectroscopy.

7. A method according to claim 5 further comprising the steps of:

adding an acid mixture of hydrofluoric acid and nitric

acid to the recovered decomposition residue;

heating the yield to 150 - 220°C, to allow the residue to sublimate; and

quantitatively analyzing the remnants by atomic absorption spectroscopy or by inductively coupled plasma mass spectroscopy.

8. A method according to claim 1 ~~or 2~~ wherein a silicon substrate(s) is put in one, or in two or more beakers made of a fluorine resin, and the beakers are placed on the support.

9. A method according to claim 8 further comprising the steps of:

adding an acid mixture of hydrochloric acid and nitric acid to the recovered decomposition residue;

heating the yield to 60 - 90°C, to allow the residue to sublimate; and

quantitatively analyzing the remnants by atomic absorption spectroscopy or by inductively coupled plasma mass spectroscopy.

10. A method according to claim 8 further comprising the steps of:

adding an acid mixture of hydrofluoric acid and nitric acid to the recovered decomposition residue;

heating the yield to 150 - 220°C, to allow the residue to sublimate; and

quantitatively analyzing the remnants by atomic absorption spectroscopy or by inductively coupled plasma

mass spectroscopy.

11. An apparatus for decomposing a silicon substrate through vapor-phase reaction comprising:

a reaction vessel having a container to contain a solution for decomposing a silicon substrate, and a lid for tightly sealing the container; and

a support having a pillar, and a platform on the top of and integral with the pillar, the pillar resting on the bottom of the container and protruding above the surface of the decomposition solution, and the platform carrying the silicon substrate.

12. An apparatus according to claim 11 wherein the support is made of a fluorine resin.

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